INDIANA
Epidemiology
NEWSLETTER

Indiana State Department of Health

Epidemiology Resource Center
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Indianapolis, IN 46204
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Tick-borne Disease of Indiana

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Spring has arrived and the creatures have started stirring. Among these creatures are ticks that have the potential to transmit diseases. Ticks transmit more cases of vector-borne diseases than any other vector. Four tick-borne diseases transmitted by three tick species are part of the Indiana ecology and pose a threat to human health. They are Lyme disease, Rocky Mountain spotted fever (RMSF), ehrlichiosis, and tularemia. These diseases do not occur frequently, but when they do, they can range from very mild to fatal. All of these diseases are considered zoonoses (diseases of lower animals transmissible under natural conditions from vertebrate animals to humans). Humans are an accidental host in the natural cycle of the all the agents.

Ticks

In Indiana, three tick species have been identified in the transmission of tick-borne diseases. They are the "deer tick" - *Ixodes scapularis* (Lyme disease and possibly tularemia), the "dog tick" - *Dermacentor variabilis* (RMSF and tularemia), and the "lone star tick" - *Amblyomma americanum* (ehrlichiosis, tularemia, and in some part of the country RMSF). These three tick species are members of the family *Ixodidae*, often referred to as "hard ticks". Hard tick life cycles have four stages: an egg, a six-legged larva, an eight-legged nymph, and an eight-legged reproductive adult. This life cycle can range from 90 days up to two years. Both the larval and nymph stages require a blood meal for transformation into the next stage. The adult female requires a blood meal to develop her one batch of eggs, which may number into the thousands.

Ixodes scapularis

(Image courtesy of Iowa State University)

Dermacentor variabilis

Ticks feed on different hosts at each stage of their life cycle. Larva and nymphs generally prefer small mammals such as field mice, but will also feed on larger mammals including humans. During the larval stage, ticks can become infected at the initial blood meal from an infected reservoir host and maintain the infection through its subsequent life stages where disease transmission can occur to other non-infected hosts. Lone star ticks may feed on deer at all stages of development. There is some evidence that one type of ehrlichiosis is maintained in nature in a tick-white tailed deer cycle without a second host.

Amblyomma americanum

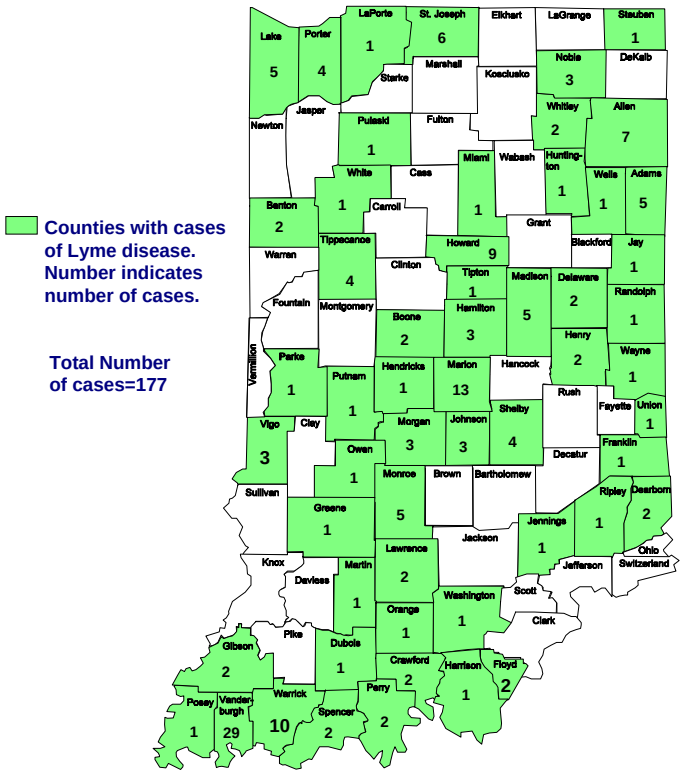
Hard ticks seek hosts by behavior known as "questing" whereby the ticks position themselves on stems of grass, or leaves of low bushes and extend their front legs to grab a host as they pass by. This behavior is stimulated by the presence of increased levels of carbon dioxide (exhaled breath of a mammals), body heat, and movement. Once on a host, ticks attach to their hosts by inserting their mouth parts into the host's skin and may feed for extended periods of time ranging from days to weeks.

Lyme Disease

Lyme disease, the most commonly diagnosed tick borne disease in Indiana, was first recognized in the U.S. after a high incidence of arthritis was observed in children around Lyme, Connecticut in the mid-1970s. Since 1990, there have been 172 Lyme disease cases confirmed among Hoosiers from 56 counties. Fifteen percent of these cases were children 10 years of age or younger. Lyme disease has been reported from many states, but 90% of the cases are reported from approximately 140 counties located along the northeastern and mid-Atlantic seaboard (Massachusetts to Delaware) and the upper north-central region (Wisconsin and parts of Minnesota).

Lyme disease is caused by the bacteria *Borrelia burgdorferi*, which is a (spirochete), and resembles syphilis (also a spirochete) in that there are acute and chronic multi-systemic disease manifestations. Lyme disease can be divided into two clinical stages of illness: early and late. Early signs and symptoms may include a macular dermatitis called, erythema migrans, which occurs in about 60-80% of patients. The erythema migrans is generally round or oval and greater than 5cm in diameter. Over time, the lesion expands and develops a central clearing giving a "bulls-eye" appearance. Incubation time from exposure to an infected tick to the appearance of the erythema migrans is 3-32 days. The tick must feed on the individual for a minimum of 24 hours in order for disease transmission to occur. Additional symptoms that may be present are low-grade fever, headache, fatigue, and joint and muscle pain.

Confirmed Human Lyme Cases by County of Residence, 1990 - 1999



When Lyme disease disseminates throughout the body, additional skin lesions may be present. The most common neurological manifestation of disseminated Lyme disease is cranial neuritis, often presenting as a facial paralysis (Bell's palsy). Other neurological symptoms can include peripheral neuropathy, lymphocytic meningitis, or meningoencephalitis. Atrioventricular blocks requiring the insertion of temporary pacemakers have been seen in a few patients. Another manifestation is arthritis involving the large joints, especially the knees. Chronic manifestations include arthritis and neurological syndromes. If left untreated, chronic Lyme arthritis may last for several years and the neurological syndromes may last more than 10 years.

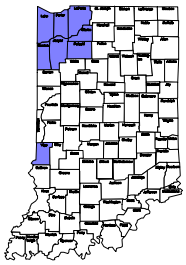
Diagnosis should be based on clinical findings in a patient who has recently been exposed to ticks in an endemic area. Laboratory confirmations are accomplished by culture or biopsy of the skin lesion and identification of the causative organism *B. burgdorferi*. Serological testing may be employed to support the clinical diagnosis. The Centers for Disease Control and Prevention (CDC) recommends a two-step testing method to improve reliability. The first step is detection of total or class-specific antibodies (IgM or IgG) by enzyme-linked immunosorbent technology (ELIZA or EIA) or indirect immunofluorescence microscopy (IFA). If first-step testing is positive or equivocal, the second test, a Western immunoblot, is indicated. If the disease has been present for more that one month, both IgM and IgG Western immunoblot should be performed. Interpretation of the Western immunoblot and complete CDC recommendations are available in the MMWR, Vol. 44/No. 31, August 25, 1995.

Early Lyme disease responds to antimicrobials such as doxycycline, amoxicillin, or azithromycin when prescribed for two to three weeks. Treatment for late Lyme disease often requires the use of intravenous antimicrobials, usually ceftriaxone or penicillin, typically for two or three weeks. Late Lyme disease may not respond to antimicrobial treatment. The use of antibiotics as prophylaxis for an asymptomatic individual with a history of a tick bite acquired in an endemic area is controversial. While deer ticks (*Ixodes scapularis*) have been found in 59 Indiana counties, the risk for acquiring an infection appears to be quite low even in those counties where a high number of ticks have been identified.

In 1999, the US Food and Drug Administration (FDA) approved a Lyme disease vaccine for use in humans between 15 and 70 years of age. The vaccine requires three doses injected into the deltoid muscle. The second dose is given 30 days after the first dose, and the third is given one year after the first. In June 1999, the Advisory Committee on Immunization Practices (ACIP) issued its recommendations for use of the vaccine. The decision to administer this vaccine to an individual should be based on the likelihood of the individual being bitten by an *Ixodes scapularis* tick infected with *B. burgdorferi*. Factors that should be examined are density of vector ticks in the environment; the prevalence of *B.burgdorferi* infections in vector ticks; and the extent of person-tick contact (type, frequency, and duration of activities in tick-infected environments).

ACIP recommendations are that Lyme disease vaccine be considered for those persons who reside, work, or recreate in areas of high or moderate risk and who have frequent or prolonged exposure to tick-infested habitat. Vaccination may be considered for those whose exposure to tick-infested habitat is neither frequent nor prolonged. Lyme disease vaccine is not recommended for those individuals who have minimal or no exposure to tick habitat in high or moderate risk areas or individuals who live in low or minimal risk areas. A more a complete description of this recommendation can be found in the MMWR (Vol. 48, No. RR-7, June 4, 1999).

Indiana counties that are judged to have a moderate risk of exposure to Lyme disease are Lake, Porter, LaPorte, Starke, Pulaski, Jasper, Newton, and Vigo. All other Indiana counties are considered to be low or minimal risk. Lyme disease prevention for most Hoosiers is best accomplished by basic personal protection against ticks as discussed in the last section of this article.



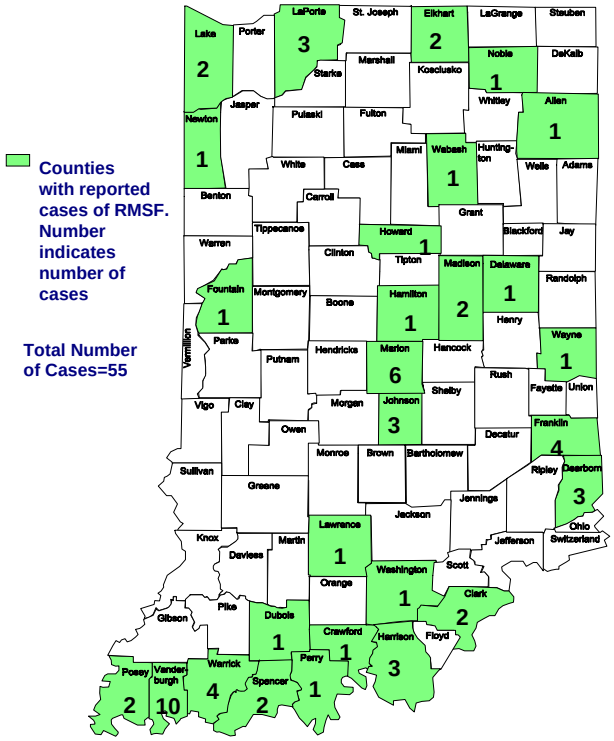
Rocky Mountain Spotted Fever (RMSF)

Rocky Mountain Spotted Fever is actually a misnomer, as most cases occur in the southern and South Central states. The disease was first recognized in the Bitterroot, Snake, and Boise River valleys in the late 1800's. Between 1906 and 1910 Howard Ricketts identified the causative organism which bears his name, *Rickettsia rickettsii*. Since 1990, fifty-five RMSF cases have been reported from 25 Indiana counties. Twenty-five percent of the cases were in children 10 years of age or younger. The accompanying map shows the distribution of cases by county of residence.

Maintenance and transmission of *R. rickettsii* requires both the tick and a number of mammalian hosts. The agent can be propagated by vertical transmission (transovarial and from larva-nymph-adult) in reservoir ticks and horizontally in a tick-mammal-tick cycle. Field mice, cotton rats, pine voles, rabbits, opossums, chipmunks, squirrels have all been identified as capable of serving as hosts for rickettsial amplification. The adult dog tick, *Dermacentor variabilis*, feeds on larger mammals such as dogs, cattle, deer, and horses and is the only stage that feeds on humans.

The clinical presentation of RMSF can vary from a mild viral-like disease to a devastatingly fatal disease characterized by major organ system failure and shock. Symptoms of RMSF can occur as early as 2 days or up to 14 days after a tick bite. Ticks must feed for 6-10 hours to transmit the disease. Signs and symptoms generally include a sudden onset of moderate to high fever, severe headache, fatigue, deep muscle pain, chills, and rash. The rash generally does not appear until the third to fifth day, first on the extremities, then on the palms and soles, and rapidly to the rest of the body. If untreated, the case fatality may reach 25%, and may approach 3-5% even with treatment. In 1987 and 1988, a 25-year-old female from Allen County and a 65-year-old male from Delaware County respectively died of RMSF. Fatalities are generally associated with delayed treatment and patient's age greater than 40 years.

Rocky Mt. Spotted Fever Cases by County of Residence, 1990 - 1999



The diagnosis of RMSF is primarily based on clinical suspicion. However, not all patients present with characteristic signs and symptoms. Ten to 15% do not develop a rash, and only 50% remember a tick bite. Laboratory diagnosis can be accomplished in a number of ways. The agent can be cultivated from clinical specimens on antibiotic free cell cultures. Serological testing has been most frequently used to confirm a clinical diagnosis. A fourfold titer increase in acute-convalescent sera is indicative of a recent infection.

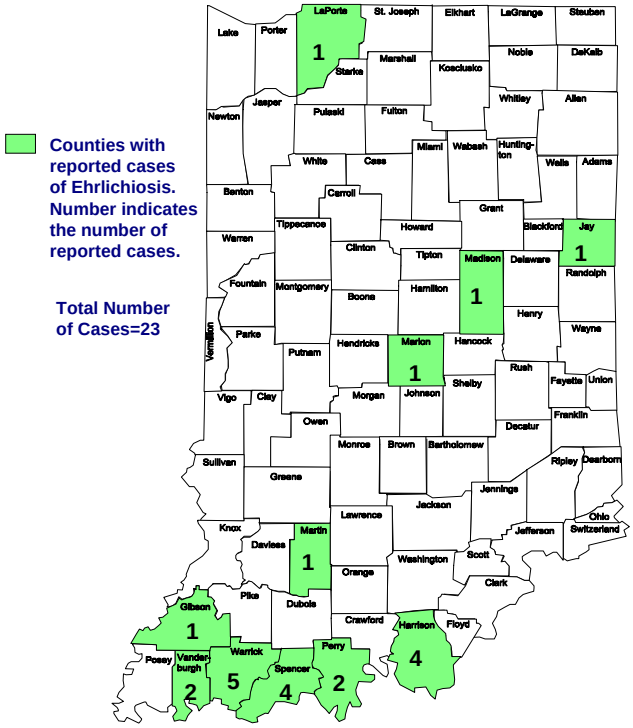
Treatment for RMSF includes tetracycline, doxycycline, and chloramphenicol. In vitro, *R. rickettsii* has shown sensitivity to ciprofloxacin and pefloxacin. There is not a vaccine to prevent RMSF. Therefore, effective use of basic personal protection against ticks as discussed at the end of the article is essential to prevent the acquisition of this disease.

Ehrlichiosis

Ehrlichiosis is an emerging disease in both human and veterinary medicine, with the various *Ehrlichia* species only being recognized in the last half of the 20th century. The first human case was diagnosed in 1986 in a 51year old man from Detroit, Michigan who had been exposed to ticks in Arkansas. In 1990, the agent of Human Monocytic Ehrlichiosis (HME) was isolated from an U.S. Army reservist at Fort Chaffee, Arkansas, hence the name *Ehrlichia chaffeensis*. Another form of this disease, Human Granulocytic Ehrlichiosis (HGE), was identified in Minnesota and Wisconsin in a number of cases between 1990 and 1993. The agent of HGE has not been named, but current research indicates that it is closely related to the *Ehrlichia* of cattle and horses. All fifty states have reported cases of ehrlichiosis, but the concentration of cases have been in the south central states (HME) and Minnesota and Wisconsin (HGE). Twenty-three cases from 11 counties have been reported in Indiana with a median age of 44 years (also the national median age). Tick vectors have been identified as *Amblyomma americanum* (HME), possibly *Dermacentor variabilis* (HME), and *Ixodes scapularis* (HGE). The probable mammalian reservoir host for *E. chaffeensis* is white-tailed deer. All stages of *Amblyomma americanum* will feed on white-tailed deer and may become infected or infect the deer. In addition, the tick is able to transmit the agent vertically through its life stages.

Symptoms of ehrlichiosis occur 1 to 21 days (average 7 days) following the bite of an infected tick and resemble those of RMSF. The severity of disease can vary from asymptomatic infection to severe complications which can be life threatening. Characteristic clinical presentations include high fever, headache, fatigue, muscle aches, nausea, vomiting, and anorexia. A rash similar to that seen in RMSF occurs in approximately 33% of patients with HME, but less frequently in patients with HGE. Common clinical findings are leukopenia, absolute lymphopenia, thrombocytopenia, and elevated serum hepatic aminotransferase. Severe complications have included renal failure, encephalopathy, and respiratory failure. Reported case fatality rates have been approximately 5% for HME and 10% for HGE.

Ehrlichiosis Cases by County of Residence, 1990 - 1999



The diagnosis of ehrlichiosis is based primarily on clinical findings with accompanying serological testing for confirmation. Indirect immunofluorescent antibody (IFA) showing a fourfold rise in antibody titers from acute and convalescent sera, PCR amplification of ehrlichial DNA from a clinical sample, or detection of morulae within infected leukocytes are confirmatory.

Treatment with tetracycline has been used successfully to treat ehrlichiosis. In cell culture, doxycycline and rifampin have been shown to kill the organism. *E. chaffeensis* is resistant to chloramphenicol, ciprofloxacin, erythromycin, cotrimoxazole, gentamicin, and penicillin in cell culture.

While Indiana has had a limited number of confirmed cases of ehrlichiosis, it does constitute a health treat to those individuals exposed to tick habitat. There is not a vaccine against the disease and prevention must be based on basic personal protection against ticks.

Tularemia

Tularemia is caused by the bacteria *Francisella tularensis* that was identified in the early 1900's in Tulare County, California. Tularemia infects and causes disease in a wide range of reservoir animals. It has been mostly associated with lagomorphs (e.g. rabbits, hares, etc.) and rodents (e.g. mice, rats, etc.). Birds, fish, amphibians, and reptiles have been identified as potential reservoirs. Tularemia can be transmitted by numerous routes. Ticks and other insects (e.g., deer flies) serve as mechanical transmitters between vertebrate hosts. Humans can also become infected by handling infected animals (i.e., rabbit fever), by consuming contaminated water, and by inhaling contaminated aerosols. The potential for aerosol transmission makes tularemia a potential Bioterrorism agent.

The initial human clinical presentation includes an abrupt onset of fever, chills, malaise, and fatigue. The disease is usually limited to a skin ulcer at the site of agent entrance with regional lymph node involvement. However, when consumed in food or water or inhaled, primary septicemia can result with case fatality rates as high as 60%. Diagnosis is generally made on clinical presentation and can be confirmed with cultures of the organism or serological testing. Treatment with streptomycin has been the antibiotic of choice, but gentamicin and fluoroquinolones have also been used with good success.

Prevention is dependent on preventing bites by ticks and other insects, not handling bodies of sick animals, and avoiding the consumption of contaminated food and water.

Personal Protective Measure

The risk of being exposed to tick-borne diseases can be reduced with these precautions:

- Remove dead leaves, tall grass, and low brush around homes, edges of gardens, and yards to reduce tick habitat.
- Avoid tick-infested areas during peak tick months (May through July).
- Wear light colored, long pants and sleeves and tuck pant legs in socks to prevent tick access to skin. Light colored clothing allows ticks on clothing to be visualized and removed. Wearing a hat reduces the chances for ticks to get into hair and onto the scalp.
- Use insect repellent containing DEET on clothes and exposed skin. Clothing can be treated with permethrin, which kills ticks on contact.
- After being outdoors, remove clothing (which should be washed and dried at high temperature to kill any ticks) and carefully search the body for any ticks.
- Remove ticks with a tweezers by grasping the tick as close to the skin surface as possible and pull straight back with a slow steady force. Do not crush the body, which can contaminate the skin with infectious agents.

Tick Identification

Citizens and health care providers who need to have a tick identified by species may submit the tick to the Public Health Entomology Lab, Department of Physiology and Health Science, Rm. CP 189, Ball State University, Muncie, IN 47306-0510. Ticks that are received alive and have been attached to humans can be cultured for Lyme Disease or RMSF. Those who submit ticks for testing must include their name and address and the name and address of the person to whom the tick was attached; plus the date, the geographic area, and the county where the tick was believed to have been acquired. To obtain tick-mailing kits, phone the lab at (765) 285-5961

References

1. Spach, David H., M.D., et al., *Tick-Borne Diseases in the United States*, New England Journal of Medicine, Vol 329:936-947, September 23, 1993
2. Beran, George W., Editor-in-Chief, *Handbook of Zoonoses, 2nd Edition*, CRC, 1994
3. Chin, James, M.D., M.P.H., Editor, *Control of Communicable Diseases Manual*, APH, 17th Edition.
4. Davison, William R., and Nettles, Victor F., Field Manual of Wildlife Disease in the Southeastern United States.
5. Palmer, S.R, et al., *Zoonoses*, Oxford Medical Publications
6. Lockhart, J. Mitchell, et al., *Isolation of Ehrlichia chaffeensis from Wild White-Tailed Deer (Odocoileus virginianus) Confirms Their Role as Natural Reservoir Host*, Journal of Clinical Microbiology, page 1681-1686, July 1997.
7. Walker, David H., M.D., Dumler, J. Stephen, M.D., *Emergence of the Ehrlichiosis as Human Health Problems, Emerging Infectious Disease*, Vol.2, No.1, January-March 1996
8. http://aepo-xdv-www.epo.cdc.gov/wonder/prevguid/p0000380/body001.htm
9. http://entomology.ucdavis.edu/faculty/rbkimsey/tickbio.html
10. http://www.uri.edu/artsci/zool/ticklab/lyme4.html
11. MMWR, Vol. 48, No. RR-7, *Recommendations for the Use of Lyme Disease Vaccine*, Recommendations of the Advisory Committee on Immunization Practices (ACIP)
12. http://www.mc.vanderbilt.edu/peds/pidl/infect/rmsf.htm
13. http://chppm-www.apgea.army.mil/ento/erlichio.htm
14. Iowa State University Entomology Department at http://www.ent.iastate.edu/imagegal/ticks/

Hepatitis C: A Public Health Threat
Interactive Video Conference Planned for June 14, 2000

Julia Butwin, MSN
ISDH Communicable Disease

Introduction

The month of May is Hepatitis Awareness month. The Indiana State Department of Health (ISDH) is concentrating efforts in providing awareness of hepatitis C, a serious public health threat. Usually, acute hepatitis C is clinically silent, thus the diagnosis is rarely made during the acute phase of illness. Individuals usually present to the health care system during the chronic stages of this disease. This presents a number of challenges to health care professionals. This article provides an overview of the disease, transmission, serological testing, treatment options, and prevention activities. Readers are encouraged to review the reference articles and attend the interactive video conference planned for June 14, 2000 to gain an in-depth knowledge of the issues and challenges in prevention and control of hepatitis C.

Natural History of Hepatitis C

Hepatitis C Virus (HCV) infection is the most common chronic bloodborne disease in the United States, with an estimated 3.9 million Americans infected. The overall prevalence is 1.8%. Thus, about 2 out of every hundred people are infected. Fortunately, this is a disease with various rates of progression. About 15% of individuals acutely infected recover spontaneously; an additional 25% have no signs of illness with normal aminotransferase levels and very little histological changes of the liver. Thus, approximately 40% of persons either recover or have no long-term consequences. Most individuals with chronic hepatitis C will have minimal fibrosis but 20% of persons with chronic hepatitis C will development cirrhosis after being infected for 10 to 20 years and may die of liver disease.

Development of cirrhosis most likely depends upon the following cofactors:

- Age at the time of infection (the disease generally progresses more rapidly when the disease is acquired at an older age)
- Alcoholism
- Co-infection with HIV
- Co-infection with the hepatitis B virus

Transmission

The two most common exposures associated with transmission of HCV are blood transfusions and intravenous drug use (IVDU). A large proportion of HCV infections acquired before 1992 were by blood transfusion or organ transplantation. Since that time, the blood supply has been screened making transmission by blood transfusion or organ transplantation rare.

Other modes of transmission include:

- Health Care Setting Modes: Most likely in hemodialysis units or possibly as a result of an accidental needlestick.
- Sexual: Low risk in long-term spouses and higher risk for both heterosexuals and homosexual males when associated with multiple sex partners, a history of sexually transmitted disease and failure to use condoms.
- Perinatal: The average rate of HCV infection in infants born to HCV positive/HIV negative women is 5% but increases to 14% when the mother is co-infected with HIV.

Studies have shown no association with military service or exposures resulting from medical or dental procedures, tattooing, acupuncture, ear piercing or foreign travel. If transmission occurs from these exposures, the number of cases may be too low to detect. Transmission to nonsexual household contacts appears to be uncommon. In addition, about 10% of cases do not identify a risk factor. Most people in this category are known to be of low socioeconomic level. Low socioeconomic level has been associated with higher than average numbers of infectious diseases and may be a surrogate for high-risk exposures.

Serologic Testing

Several serological tests are now available and used for screening, diagnosis, and monitoring treatment. These tests include the following:

- Enzyme Immunoassay: The third-generation enzyme assay test (EIA) is used now and is more reliable than previous EIA tests. However, as with all enzyme immunoassays, false-positive results occasionally occur. Thus, additional or confirmatory testing should occur.
- Recombinant Immunoblot Assay: Immunoblot assays are valuable in verifying anti-HCV reactivity.
- Polymerase Chain Reaction (PCR) Amplification: PCR amplification can detect low levels of HCV RNA in serum and is a reliable way of demonstrating that HCV infection is present. The level of virus in the serum can also be measured. Although viral load does not correlate with the severity of hepatitis or with a poor progress, the viral load does correlate with the likelihood of a response to antiviral therapy. Persons with low levels of HCV RNA have higher response rates to treatment.
- Genotyping and Serotyping: There are 6 known genotypes and 50 subtypes of hepatitis C. Knowing these results is helpful in both defining the epidemiology and in making recommendations regarding treatment. Individuals with genotypes 2 and 3 are more likely to respond to the present therapies available.

Although the Indiana Communicable Disease Reporting Rule does not require laboratory reporting of anti-HCV at the present time, many laboratories have voluntarily reported testing. In 1998, 68% of persons reported as tested had only anti-HCV testing and in 1999, 75% of the 4222 persons tested met this criterion. Thus, only 25% of persons tested for anti-HCV and reported to ISDH in 1999 had confirmatory testing reported. The ISDH plans to look closely at hepatitis C testing in Indiana to determine if the recommended medical follow-up is occurring after individuals test positive for anti-HCV.

Treatment Options

In the United States there are now two different treatment regimes approved for treatment of hepatitis C, monotherapy with alpha interferon and combination therapy with alpha interferon and ribavirin. Combination therapy is preferred since it yields higher rates of sustained response (undetectable HCV for 6 months or more after therapy is complete) than monotherapy. The sustained response after combination therapy is 35 to 45 percent compared with 15 to 20 percent for monotherapy. The negative features of combination therapy are that the medication is expensive and there are several side effects associated with the medicine.

Not all individuals should be offered treatment. The National Institutes of Health Consensus Development Conference Panel recommended that therapy be limited to those persons who have histological evidence of progressive disease. Thus, the panel recommended those persons with fibrosis or moderate to severe degrees of inflammation and necrosis on liver biopsy should be treated and those persons with less severe histological disease are managed on an individual basis. Concurrent medication and the individual's medical condition must be taken into consideration when deciding whether to treat an individual co-infected with HIV. In addition, there are many contraindications to the use of both alpha interferon and ribavirin.

Prevention

The Centers for Disease Control and Prevention stress the need for public health prevention efforts. Reducing the burden of HCV infection requires both primary and secondary prevention activities. Primary activities are those that reduce or eliminate risk for HCV transmission, including:

- Donor screening and testing and virus inactivation of plasma-derived products
- Risk reduction counseling and services for persons with high-risk activities, such as IVDU and persons with multiple sex partners.
- Implementation and maintenance of infection control practices.

Secondary Prevention activities reduce the risk for development of cirrhosis and include identifying HCV-infected persons through diagnostic testing and then providing counseling and appropriate medical management. In the United States routine testing for HCV is based on the risk for infection or a recognized exposure. Persons offered testing should include the following:

- Persons who ever injected illegal drugs
- Persons with certain medical conditions, including
  - Persons who received clotting factor concentrates before 1987
  - Persons who were ever on long-term hemodialysis
  - Persons with persistently abnormal alanine aminotransferase levels
- Persons who received transfusions or organ transplants prior to July 1992
- Healthcare, emergency medical, and public safety workers ONLY after needle sticks, sharps, or mucosal exposure to HCV-positive blood
- Children born to HCV-positive women

Since testing for anti-HCV should be accompanied by appropriate counseling and medical follow-up, it is important that public health and other health care personnel understand the disease, including the natural history of the disease, transmission, serological testing, treatment options, and prevention activities.

Interactive Video conference

The Indiana University School of Medicine and the Indiana State Department of Health are jointly sponsoring an interactive video conference on hepatitis C on the morning of June 14, 2000. The video conference will be available at various sites around the state including Emerson Hall at the Indiana University School of Medicine campus, IU South Bend, IU East, and IU Southeast. This program will also most likely be offered in Evansville. Contact the IU School of Medicine Division of Continuing Education at (800) 622-4989 if you are interested in attending this program in Evansville. The program will also be offered at several prison sites (for prison staff only). The complete brochure, including a registration form, is included in this publication. If you are unable to print the registration form and wish to participate in the video conference, you can either e-mail the registration information to Julia Butwin (jbutwin@isdh.state.in.us) or call 317/233-7125 and a form will be mailed to you.

This video conference is designed for public health professional, physicians, nurses, social workers, addictions counselors and others in the health care community who come into contact with persons with hepatitis C. The video conference should increase the health care professionals' knowledge of the disease so that both primary and secondary prevention activities can be carried out effectively.

References

1. Centers for Disease Control and Prevention. *Recommendations for the prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease*. MMWR 1998: 47 (No. RR-19): 1-39.
2. Alter MJ. *Hepatitis C virus infections in the United States*. Journal of Hepatology 1999: 31: (suppl. 1): 88-91.
3. Marcellin P. *Hepatitis C: the clinical spectrum of disease*. Journal of Hepatology 1999: 31: (suppl. 1): 9-16
4. EASL International Consensus Conference on Hepatitis C (1999). Journal of Hepatology 1999: 31: (suppl. 1): 3-8.
5. National Digestive diseases Information Clearinghouse. *Chronic Hepatitis C: Current Disease Management*. E-text last updated February 2000. (http://www.niddk.nih.gov/health/digest/pubs/chrnhepc/chrnhepc.htm)

WEDNESDAY, JUNE 14

Emerson Hall Auditorium
IU School of Medicine Campus (Indianapolis)

IU South Bend

IU East (Richmond)

IU Southeast (New Albany)

COURSE DESCRIPTION

This video conference is designed for public health professionals, physicians, nurses, social workers, addictions counselors and others in the health care community who come into contact with the hepatitis C patient. Topics covered will include risk factors, patient response to current medical therapy, diagnosis, alpha interferon therapy, prison populations and hepatitis C, and substance abusers and hepatitis C.

OBJECTIVES

At the conclusion of this video conference, the participants should be able to

- cite at least three risk factors for contracting hepatitis C;
- compare the relationship between 'genotype' and the patient's ability to respond to current medical therapy;
- identify two characteristics in patients who should be offered treatment;
- list five common side effects of alpha interferon therapy;
- explain three primary prevention activities endorsed by the Centers for Disease Control and Prevention;
- state two challenges prison health officials face in working with inmates with hepatitis C; and
- categorize at least two concerns of substance abuse counselors in working with hepatitis C population.

FEE

There is no fee for this program; however, registration is required. Please mail or fax the registration form.

ACKNOWLEDGMENT

Our grateful acknowledgment to:
Schering Plough Pharmaceuticals
for an educational grant
in support of this program.

INDIANA UNIVERSITY SCHOOL OF MEDICINE

ACCREDITATION

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for continuing Medical Education (ACCME) through the joint sponsorship of Indiana University School of Medicine and the Indiana State Department of Health. The Indiana University School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

CREDIT

The Indiana University School of Medicine designates this education activity for a maximum of 2.25 hours in category 1 credit towards the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the education activity.

DISCLOSURE

All faculty participating in Continuing medical Education activities sponsored by the Indiana University School of Medicine are expected to disclose to the program audience any real or apparent conflict of interest related to the content of their presentations.

NOTE

While it offers the CME credit hours noted above, this activity is not intended to provide extensive training or certification in the field.

LOCATION

This video conference will be available at various sites around the state including Emerson Auditorium at the Indiana University School of Medicine campus, and:

- IU South Bend
- IU East (Richmond)
- IU Southeast (New Albany)

HEPATITIS C Interactive Video Conference

Wednesday, June 14, 2000

- Indianapolis
- South Bend
- Richmond
- New Albany

AGENDA

8:30 a.m.	Registration and Continental Breakfast (*at Emerson Hall)
9:05 a.m.	Introduction Hepatitis C: Diagnosis, Treatment and Public Health Issues *Paul Kwo, M.D.*
10:00 a.m.	Break Panel Discussion/Interviews *Paul Kwo, MD; Crystal L. Jones, MD, Sean O'Connor, MD, MPH, Dean P. Rieger, MD, MPH*
11:00 a.m.	Questions and Answers with Panel
11:30 a.m.	Adjourn

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Hepatitis C Interactive Video Conference
Wednesday, June 14, 2000

Indicate your preferred attendance site.

☒ Emerson Auditorium at IU School of Medicine
☒ IU South Bend
☒ IU East (Richmond)
☒ IU Southeast (New Albany)

☒ M.D. ☒ D.O. ☒ Other (please specify) _____

Last Name First Name Middle Initial

Business Address

City County State Zip

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Social Security Number*

*Indiana University is required to file information regarding payments of qualified tuition and fees with the Internal Revenue Service. Your Social Security number is necessary for this report. This information will be kept confidential and used only for record-keeping purposes.

We want everyone to feel welcome at this and all CME events. If you have a disability and need an accommodation to participate in this program, we will try to provide it. Please contact the CME office at 274-8353 before you come to the event. At least 72 hours notice may be necessary.

REGISTRATION

There is no fee for this course; however, registration is required.

Send registration to:
Indiana University School of Medicine, Div. of continuing Medical Education, 1226 W. Michigan St., BR 156, Indianapolis, IN 46202
Or Fax: (317) 274-4638

FURTHER INFORMATION

Registrar: Indiana University School of Medicine
Division of Continuing Medical Education
1226 W. Michigan St., BR 156, Indianapolis, IN 46202-5178, (317) 274-8353 Fax: (317) 274-4638
Nationwide: (800) 622-4989 (Request the Division of Continuing Medical Education.)
http://iumeded.med.iupui.edu

Questions and Answers About Pneumococcal Disease and the New Pneumococcal Conjugate Vaccine

Wayne Staggs, MS
ISDH Epidemiology Resource Center

What disease kills more people in the United States than all other vaccine-preventable diseases?

Pneumococcal infections cause more than 40,000 deaths each year in the U.S.[1]

What is pneumococcal disease and what are the major clinical syndromes it causes?

Pneumococcal disease infections are caused by the bacteria *Streptococcus pneumoniae*, also known as pneumococcus. Each year in the U.S., pneumococcal disease accounts for an estimated 3,000 cases of meningitis, 50,000 cases of bacteremia, 500,000 cases of pneumonia and 7 million cases of otitis media.[1]

How is Streptococcus pneumoniae transmitted?

Streptococcus pneumoniae is transmitted by droplet spread, by direct oral contact, or indirectly through articles freshly soiled with respiratory discharges. Person to person transmission is common, but illness among casual contacts and health care workers is infrequent and thus antibiotic prophylaxis of contacts is not a routine practice. The immunologic mechanism that allows the disease to occur in a carrier is not clearly understood. Invasive pneumococcal disease most often occurs when a predisposition condition exists, particularly pulmonary disease. Incidence is highest during winter and spring months.

Is pneumococcal disease reportable to the Indiana State Department of Health?

The ISDH has voluntarily requested information on invasive pneumococcal isolates since 1998. Laboratories and local health department staff have been most cooperative in this effort, with almost 700 cases of invasive disease being reported in 1999. A form specific to *Streptococcus pneumoniae* has been developed for use by local health departments and others to collect surveillance data on this disease. You may obtain the most current copy (9-99) of this form by contacting Wayne Staggs, ISDH, at 317-233-7112. Later this year, pending approval of the amended Communicable Disease Reporting Rule, reporting of invasive pneumococcal disease and antibiotic sensitivity test results will become mandatory.

Is drug resistance a serious problem?

Yes, resistance to penicillin (the antibiotic of choice for treating pneumococcal disease) and other antibiotics has increased in the past 15-20 years. Studies by the CDC have revealed that resistance to antibiotics varies by region and in some areas of the U.S. as many as 30% of pneumococcal isolates are resistant to penicillin[2]. Data from Indiana's voluntary surveillance system initiated in 1998, has consistently indicated that around 25% of all pneumococcal isolates have either intermediate or high level resistance to penicillin[3]. Over 10% of the isolates reported in 1999 were resistant to two or more antibiotics[3].

What vaccines are available to prevent pneumococcal disease?

There are now **two** different types of vaccine to protect against pneumococcal disease. A 23-valent polysaccharide vaccine has been available since 1977 and provides protection against 23 types of *Streptococcus pneumoniae* that cause 88% of bacteremic pneumococcal diseases. This polysaccharide vaccine is recommended for all persons 65 years of age and older and for persons two years and older who have underlying medical conditions that make them high risk for developing pneumococcal disease. High-risk underlying conditions include those with immunosuppressive conditions, persons with diabetes, heart, lung or kidney disease and those with functional or anatomic asplenia such as sickle cell disease or splenectomy. A second pneumococcal vaccine for infants was licensed in February of this year. This new conjugate vaccine will protect against 7 of the most common types of pneumococcal bacteria that infect infants and toddlers.

What children are most likely to get pneumococcal disease?

Children under the age of two, children in group child care, and children who have certain illnesses (i.e., sickle cell disease, HIV infection, chronic heart or lung conditions) are at higher risk than other children to acquire pneumococcal disease. Also, pneumococcal disease is more common among children of certain racial or ethnic groups, such as Alaska Natives, Native Americans, and African Americans, than among other groups.

What is the schedule for the new conjugate pneumococcal vaccine?

The vaccine should be given to all infants at 2,4,and 6 months of age, followed by a booster dose at 12-15 months of age. Children who are unvaccinated and are 7-11 months of age should be given a total of 3 doses (2 months apart) and unvaccinated children 12-23 months of age should be given a total of 2 doses at least two months apart. Most children who are 24 months of age or older will need only one dose of the vaccine. More information regarding specific recommendations and scheduling situations will be available when the ACIP recommendations for pneumococcal conjugate vaccine are published.

When will the conjugate pneumococcal vaccine be available?

This vaccine, which is marketed as Prevnar® by Wyeth-Ayerst Laboratories, a Division of American Home Products Corporation, is available to private practice physicians now.

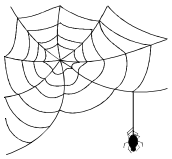
When will it be available to public clinics and physicians enrolled in the Vaccine for Children's Program (VFC)?

A contract must be negotiated between the manufacturer and the CDC before Prevnar® will be available to public vaccine providers or through the VFC program. It is anticipated that the vaccine should be available to public and VFC providers later this year.

[1]CDC. Prevention of pneumococcal disease. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1997;46 (No. RR-8):1-24.

[2]CDC. Defining the Public Health Impact of Drug-Resistant *Streptococcus pneumoniae*: Report of a Working Group. MMWR 1996; 45 (No. RR-1): 1-20.

[3]ISDH. Unpublished 1998-99 surveillance data.



Wonderful Wide Web Sites

ISDH Data Reports Available

The ISDH Epidemiology Resource Center has the following data reports and the Indiana Epidemiology Newsletter available on the ISDH Web Page:

http://www.state.in.us/isdh/ (under Data and Statistics)

Indiana Cancer Incidence Report (1990, 95)

Indiana Cancer Mortality Report (1990-1994)

Indiana Health Behavior Risk Factors (1995-96, 97, 98)

Indiana Hospital Consumer Guide (1996)

Indiana Marriage Report (1995, 96, 97)

Indiana Mortality Report (1995, 97)

Indiana Natality Report (1995, 96, 97)

Indiana Natality/Induced Termination of Pregnancy/Marriage Report (1998)

Indiana Report of Diseases of Public Health Interest (1997, 98)

The following site allows access to the web page for any state health department in the United States:

http://www.polsci.wvu.edu/grad/klase/STATEHEALTH/sthlth.html

HIV Disease Summary

Information as of March 31, 2000 (population 5,840,528).

HIV - without AIDS to date:

243	New cases from April 1999 thru March 2000	12-month incidence:	4.16 cases/100,000
3,148	Total HIV-positive, without AIDS on March 31, 2000[1]	Point prevalence:	53.90 cases/100,000[1]

AIDS cases to date:

305	New AIDS cases from April 1999 thru March 2000	12-month incidence:	5.22 cases/100,000
2,511	Total AIDS cases on March 31, 2000[1]	Point prevalence:	43.00 cases/100,000[1]
5,802	Total AIDS cases, cumulative (alive and dead)		

[1] Counting only cases alive in March 2000

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in March		Cumulative Cases Reported through March	
	1999	2000	1999	2000
Campylobacteriosis	12	10	60	39
E. coli O157:H7	4	1	9	2
Giardiasis	16	23	61	96
Hepatitis A	19	5	31	8
Hepatitis B	3	4	7	5
Legionellosis	4	2	5	6
Lyme Disease	0	0	0	0
Meningococcal, invasive	0	4	6	18
Pertussis	4	5	8	8
Rocky Mountain Spotted Fever	0	0	0	1
Salmonellosis	16	30	48	76
Shigellosis	4	14	18	63
Tuberculosis	9	17	23	36
Animal Rabies	0	0	0	0

For information on reporting of communicable diseases in Indiana, call the *ISDH Communicable Disease Division* at (317) 233-7665.

Indiana
Epidemiology
Newsletter

The *Indiana Epidemiology Newsletter* is published by the Indiana State Department of Health to provide epidemiologic information to Indiana health professionals and to the public health community.